



SEQUENCE LISTING

<110> Matti Sallberg
Catharina Hultgren

<120> VACCINES CONTAINING RIBAVIRIN AND
METHODS OF USE THEREOF

<130> TRIPEP.23AUS2C1

<140> 10/817,591

<141> 2004-04-02

<150> 10/719,619

<151> 2003-11-20

<150> 10/104,966

<151> 2002-03-22

<150> 09/929,955

<151> 2001-08-15

<150> 09/705,547

<151> 2000-11-03

<150> 60/229,175

<151> 2000-08-29

<150> 60/225,767

<151> 2000-08-17

<160> 49

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 3011

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus sequence

<400> 1

Met	Ser	Thr	Asn	Pro	Lys	Pro	Gln	Arg	Lys	Thr	Lys	Arg	Asn	Thr	Asn
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Arg	Arg	Pro	Gln	Asp	Val	Lys	Phe	Pro	Gly	Gly	Gly	Gln	Ile	Val	Gly
			20					25					30		
Gly	Val	Tyr	Leu	Leu	Pro	Arg	Arg	Gly	Pro	Arg	Leu	Gly	Val	Arg	Ala
		35					40					45			
Thr	Arg	Lys	Thr	Ser	Glu	Arg	Ser	Gln	Pro	Arg	Gly	Arg	Arg	Gln	Pro
	50					55					60				
Ile	Pro	Lys	Ala	Arg	Arg	Pro	Glu	Gly	Arg	Thr	Trp	Ala	Gln	Pro	Gly

65					70					75					80
Tyr	Pro	Trp	Pro	Leu	Tyr	Gly	Asn	Glu	Gly	Cys	Gly	Trp	Ala	Gly	Trp
				85					90					95	
Leu	Leu	Ser	Pro	Arg	Gly	Ser	Arg	Pro	Ser	Trp	Gly	Pro	Thr	Asp	Pro
			100					105					110		
Arg	Arg	Arg	Ser	Arg	Asn	Leu	Gly	Lys	Val	Ile	Asp	Thr	Leu	Thr	Cys
		115					120					125			
Gly	Phe	Ala	Asp	Leu	Met	Gly	Tyr	Ile	Pro	Leu	Val	Gly	Ala	Pro	Leu
	130					135					140				
Gly	Gly	Ala	Ala	Arg	Ala	Leu	Ala	His	Gly	Val	Arg	Val	Leu	Glu	Asp
145					150					155					160
Gly	Val	Asn	Tyr	Ala	Thr	Gly	Asn	Leu	Pro	Gly	Cys	Ser	Phe	Ser	Ile
				165					170					175	
Phe	Leu	Leu	Ala	Leu	Leu	Ser	Cys	Leu	Thr	Val	Pro	Ala	Ser	Ala	Tyr
			180					185					190		
Gln	Val	Arg	Asn	Ser	Ser	Gly	Leu	Tyr	His	Val	Thr	Asn	Asp	Cys	Pro
		195					200					205			
Asn	Ser	Ser	Val	Val	Tyr	Glu	Ala	Ala	Asp	Ala	Ile	Leu	His	Thr	Pro
	210					215					220				
Gly	Cys	Val	Pro	Cys	Val	Arg	Glu	Gly	Asn	Ala	Ser	Arg	Cys	Trp	Val
225					230					235					240
Ala	Val	Thr	Pro	Thr	Val	Ala	Thr	Arg	Asp	Gly	Lys	Leu	Pro	Thr	Thr
				245					250					255	
Gln	Leu	Arg	Arg	His	Ile	Asp	Leu	Leu	Val	Gly	Ser	Ala	Thr	Leu	Cys
			260					265					270		
Ser	Ala	Leu	Tyr	Val	Gly	Asp	Leu	Cys	Gly	Ser	Val	Phe	Leu	Val	Gly
	275						280					285			
Gln	Leu	Phe	Thr	Phe	Ser	Pro	Arg	His	His	Trp	Thr	Thr	Gln	Asp	Cys
	290					295					300				
Asn	Cys	Ser	Ile	Tyr	Pro	Gly	His	Ile	Thr	Gly	His	Arg	Met	Ala	Trp
305					310					315					320
Asn	Met	Met	Met	Asn	Trp	Ser	Pro	Thr	Ala	Ala	Leu	Val	Val	Ala	Gln
				325					330					335	
Leu	Leu	Arg	Ile	Pro	Gln	Ala	Ile	Met	Asp	Met	Ile	Ala	Gly	Ala	His
			340					345					350		
Trp	Gly	Val	Leu	Ala	Gly	Ile	Lys	Tyr	Phe	Ser	Met	Val	Gly	Asn	Trp
	355						360					365			
Ala	Lys	Val	Leu	Val	Val	Leu	Leu	Leu	Phe	Ala	Gly	Val	Asp	Ala	Glu
	370					375					380				
Thr	His	Val	Thr	Gly	Gly	Asn	Ala	Gly	Arg	Thr	Thr	Ala	Gly	Leu	Val
385					390					395					400
Gly	Leu	Leu	Thr	Pro	Gly	Ala	Lys	Gln	Asn	Ile	Gln	Leu	Ile	Asn	Thr
				405					410					415	
Asn	Gly	Ser	Trp	His	Ile	Asn	Ser	Thr	Ala	Leu	Asn	Cys	Asn	Glu	Ser
			420					425					430		
Leu	Asn	Thr	Gly	Trp	Leu	Ala	Gly	Leu	Phe	Tyr	Gln	His	Lys	Phe	Asn
	435						440					445			
Ser	Ser	Gly	Cys	Pro	Glu	Arg	Leu	Ala	Ser	Cys	Arg	Arg	Leu	Thr	Asp
	450					455					460				
Phe	Ala	Gln	Gly	Trp	Gly	Pro	Ile	Ser	Tyr	Ala	Asn	Gly	Ser	Gly	Leu
465					470					475					480
Asp	Glu	Arg	Pro	Tyr	Cys	Trp	His	Tyr	Pro	Pro	Arg	Pro	Cys	Gly	Ile
				485					490					495	
Val	Pro	Ala	Lys	Ser	Val	Cys	Gly	Pro	Val	Tyr	Cys	Phe	Thr	Pro	Ser
			500					505					510		

Pro	Val	Val	Val	Gly	Thr	Thr	Asp	Arg	Ser	Gly	Ala	Pro	Thr	Tyr	Ser		
	515						520					525					
Trp	Gly	Ala	Asn	Asp	Thr	Asp	Val	Phe	Val	Leu	Asn	Asn	Thr	Arg	Pro		
	530					535					540						
Pro	Leu	Gly	Asn	Trp	Phe	Gly	Cys	Thr	Trp	Met	Asn	Ser	Thr	Gly	Phe		
545					550					555					560		
Thr	Lys	Val	Cys	Gly	Ala	Pro	Pro	Cys	Val	Ile	Gly	Gly	Val	Gly	Asn		
			565						570					575			
Asn	Thr	Leu	Leu	Cys	Pro	Thr	Asp	Cys	Phe	Arg	Lys	Tyr	Pro	Glu	Ala		
		580						585					590				
Thr	Tyr	Ser	Arg	Cys	Gly	Ser	Gly	Pro	Arg	Ile	Thr	Pro	Arg	Cys	Met		
	595						600					605					
Val	Asp	Tyr	Pro	Tyr	Arg	Leu	Trp	His	Tyr	Pro	Cys	Thr	Ile	Asn	Tyr		
	610					615					620						
Thr	Ile	Phe	Lys	Val	Arg	Met	Tyr	Val	Gly	Gly	Val	Glu	His	Arg	Leu		
625					630					635					640		
Glu	Ala	Ala	Cys	Asn	Trp	Thr	Arg	Gly	Glu	Arg	Cys	Asp	Leu	Glu	Asp		
			645						650					655			
Arg	Asp	Arg	Ser	Glu	Leu	Ser	Pro	Leu	Leu	Leu	Ser	Thr	Thr	Gln	Trp		
		660						665					670				
Gln	Val	Leu	Pro	Cys	Ser	Phe	Thr	Thr	Leu	Pro	Ala	Leu	Ser	Thr	Gly		
	675						680					685					
Leu	Ile	His	Leu	His	Gln	Asn	Ile	Val	Asp	Val	Gln	Tyr	Leu	Tyr	Gly		
	690				695					700							
Val	Gly	Ser	Ser	Ile	Ala	Ser	Trp	Ala	Ile	Lys	Trp	Glu	Tyr	Val	Val		
705					710					715					720		
Leu	Leu	Phe	Leu	Leu	Leu	Ala	Asp	Ala	Arg	Val	Cys	Ser	Cys	Leu	Trp		
			725					730						735			
Met	Met	Leu	Leu	Ile	Ser	Gln	Ala	Glu	Ala	Ala	Leu	Glu	Asn	Leu	Val		
		740						745					750				
Ile	Leu	Asn	Ala	Ala	Ser	Leu	Ala	Gly	Thr	His	Gly	Leu	Val	Ser	Phe		
	755					760						765					
Leu	Val	Phe	Phe	Cys	Phe	Ala	Trp	Tyr	Leu	Lys	Gly	Arg	Trp	Val	Pro		
	770					775					780						
Gly	Ala	Val	Tyr	Ala	Leu	Tyr	Gly	Met	Trp	Pro	Leu	Leu	Leu	Leu	Leu		
785					790					795					800		
Leu	Ala	Leu	Pro	Gln	Arg	Ala	Tyr	Ala	Leu	Asp	Thr	Glu	Val	Ala	Ala		
			805					810						815			
Ser	Cys	Gly	Gly	Val	Val	Leu	Val	Gly	Leu	Met	Ala	Leu	Thr	Leu	Ser		
		820						825					830				
Pro	Tyr	Tyr	Lys	Arg	Tyr	Ile	Ser	Trp	Cys	Met	Trp	Trp	Leu	Gln	Tyr		
	835					840						845					
Phe	Leu	Thr	Arg	Val	Glu	Ala	Gln	Leu	His	Val	Trp	Val	Pro	Pro	Leu		
	850					855					860						
Asn	Val	Arg	Gly	Gly	Arg	Asp	Ala	Val	Ile	Leu	Leu	Thr	Cys	Val	Val		
865					870					875					880		
His	Pro	Ala	Leu	Val	Phe	Asp	Ile	Thr	Lys	Leu	Leu	Leu	Ala	Ile	Phe		
			885					890						895			
Gly	Pro	Leu	Trp	Ile	Leu	Gln	Ala	Ser	Leu	Leu	Lys	Val	Pro	Tyr	Phe		
		900						905					910				
Val	Arg	Val	Gln	Gly	Leu	Leu	Arg	Ile	Cys	Ala	Leu	Ala	Arg	Lys	Ile		
	915						920					925					
Ala	Gly	Gly	His	Tyr	Val	Gln	Met	Ala	Ile	Ile	Lys	Leu	Gly	Ala	Leu		
	930					935					940						
Thr	Gly	Thr	Cys	Val	Tyr	Asn	His	Leu	Ala	Pro	Leu	Arg	Asp	Trp	Ala		

945		950		955		960
His Asn Gly Leu Arg Asp Leu Ala Val	Ala Val Glu Pro Val Val Phe					
	965		970		975	
Ser Arg Met Glu Thr Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala						
	980		985		990	
Cys Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Gln						
	995		1000		1005	
Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly Trp Arg						
	1010		1015		1020	
Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu						
	1025		1030		1035	1040
Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu						
		1045		1050		1055
Gly Glu Val Gln Ile Val Ser Thr Ala Thr Gln Thr Phe Leu Ala Thr						
	1060		1065		1070	
Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg						
	1075		1080		1085	
Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Thr Tyr Thr Asn Val						
	1090		1095		1100	
Asp Gln Asp Leu Val Gly Trp Pro Ala Pro Gln Gly Ser Arg Ser Leu						
	1105		1110		1115	1120
Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His						
		1125		1130		1135
Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu						
	1140		1145		1150	
Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro						
	1155		1160		1165	
Leu Leu Cys Pro Thr Gly His Ala Val Gly Leu Phe Arg Ala Ala Val						
	1170		1175		1180	
Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn						
	1185		1190		1195	1200
Leu Glu Thr Thr Met Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro						
		1205		1210		1215
Pro Ala Val Pro Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr						
	1220		1225		1230	
Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr Ala Ala Lys Gly						
	1235		1240		1245	
Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe						
	1250		1255		1260	
Gly Ala Tyr Met Ser Lys Ala His Gly Val Asp Pro Asn Ile Arg Thr						
	1265		1270		1275	1280
Gly Val Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr						
		1285		1290		1295
Gly Lys Phe Leu Ala Asp Ala Gly Cys Ser Gly Gly Ala Tyr Asp Ile						
	1300		1305		1310	
Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Ser Gly						
	1315		1320		1325	
Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val						
	1330		1335		1340	
Val Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Val Ser His Pro						
	1345		1350		1355	1360
Asn Ile Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr						
		1365		1370		1375
Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile						
	1380		1385		1390	

Phe Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val
1395 1400 1405
Ala Leu Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser
1410 1415 1420
Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ser Thr Asp Ala Leu
1425 1430 1435 1440
Met Thr Gly Phe Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr
1445 1450 1455
Cys Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile
1460 1465 1470
Glu Thr Thr Thr Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg
1475 1480 1485
Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro
1490 1495 1500
Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys
1505 1510 1515 1520
Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr
1525 1530 1535
Val Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln
1540 1545 1550
Asp His Leu Gly Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile
1555 1560 1565
Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Phe Pro
1570 1575 1580
Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro
1585 1590 1595 1600
Pro Pro Ser Trp Asp Gln Met Arg Lys Cys Leu Ile Arg Leu Lys Pro
1605 1610 1615
Thr Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln
1620 1625 1630
Asn Glu Val Thr Leu Thr His Pro Ile Thr Lys Tyr Ile Met Thr Cys
1635 1640 1645
Met Ser Ala Asp Leu Glu Val Val Thr Ser Thr Trp Val Leu Val Gly
1650 1655 1660
Gly Val Leu Ala Ala Leu Ala Ala Tyr Cys Leu Ser Thr Gly Cys Val
1665 1670 1675 1680
Val Ile Val Gly Arg Ile Val Leu Ser Gly Lys Pro Ala Ile Ile Pro
1685 1690 1695
Asp Arg Glu Val Leu Tyr Gln Glu Phe Asp Glu Met Glu Glu Cys Ser
1700 1705 1710
Gln His Leu Pro Tyr Ile Glu Gln Gly Met Met Leu Ala Glu Gln Phe
1715 1720 1725
Lys Gln Lys Ala Leu Gly Leu Leu Gln Thr Ala Ser Arg His Ala Glu
1730 1735 1740
Val Ile Thr Pro Ala Val Gln Thr Asn Trp Gln Lys Leu Glu Val Phe
1745 1750 1755 1760
Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile Gln Tyr Leu Ala
1765 1770 1775
Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala Ser Leu Met Ala
1780 1785 1790
Phe Thr Ala Ala Val Thr Ser Pro Leu Thr Thr Gly Gln Thr Leu Leu
1795 1800 1805
Phe Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu Ala Ala Pro Gly
1810 1815 1820
Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly Ala Ala Leu Asp

1825		1830		1835		1840
Ser Val Gly Leu Gly Lys Val Leu Val Asp Ile Leu Ala Gly Tyr Gly						
	1845		1850		1855	
Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile Met Ser Gly Glu						
	1860		1865		1870	
Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro Ala Ile Leu Ser						
	1875		1880		1885	
Pro Gly Ala Leu Ala Val Gly Val Val Phe Ala Ser Ile Leu Arg Arg						
	1890		1895		1900	
Arg Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met Asn Arg Leu Ile						
1905		1910		1915		1920
Ala Phe Ala Ser Arg Gly Asn His Val Ser Pro Thr His Tyr Val Pro						
	1925		1930		1935	
Glu Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu Ser Ser Leu Thr						
	1940		1945		1950	
Val Thr Gln Leu Leu Arg Arg Leu His Gln Trp Ile Ser Ser Glu Cys						
	1955		1960		1965	
Thr Thr Pro Cys Ser Gly Ser Trp Leu Arg Asp Ile Trp Asp Trp Ile						
	1970		1975		1980	
Cys Glu Val Leu Ser Asp Phe Lys Thr Trp Leu Lys Ala Lys Leu Met						
1985		1990		1995		2000
Pro Gln Leu Pro Gly Ile Pro Phe Val Ser Cys Gln Arg Gly Tyr Arg						
	2005		2010		2015	
Gly Val Trp Arg Gly Asp Gly Ile Met His Thr Arg Cys His Cys Gly						
	2020		2025		2030	
Ala Glu Ile Thr Gly His Val Lys Asn Gly Thr Met Arg Ile Val Gly						
	2035		2040		2045	
Pro Arg Thr Cys Lys Asn Met Trp Ser Gly Thr Phe Phe Ile Asn Ala						
	2050		2055		2060	
Tyr Thr Thr Gly Pro Cys Thr Pro Leu Pro Ala Pro Asn Tyr Lys Phe						
2065		2070		2075		2080
Ala Leu Trp Arg Val Ser Ala Glu Glu Tyr Val Glu Ile Arg Arg Val						
	2085		2090		2095	
Gly Asp Phe His Tyr Val Ser Gly Met Thr Thr Asp Asn Leu Lys Cys						
	2100		2105		2110	
Pro Cys Gln Ile Pro Ser Pro Glu Phe Phe Thr Glu Leu Asp Gly Val						
	2115		2120		2125	
Arg Leu His Arg Phe Ala Pro Pro Cys Lys Pro Leu Leu Arg Glu Glu						
	2130		2135		2140	
Val Ser Phe Arg Val Gly Leu His Glu Tyr Pro Val Gly Ser Gln Leu						
2145		2150		2155		2160
Pro Cys Glu Pro Glu Pro Asp Val Ala Val Leu Thr Ser Met Leu Thr						
	2165		2170		2175	
Asp Pro Ser His Ile Thr Ala Glu Ala Ala Gly Arg Arg Leu Ala Arg						
	2180		2185		2190	
Gly Ser Pro Pro Ser Met Ala Ser Ser Ser Ala Ser Gln Leu Ser Ala						
	2195		2200		2205	
Pro Ser Leu Lys Ala Thr Cys Thr Ala Asn His Asp Ser Pro Asp Ala						
	2210		2215		2220	
Glu Leu Ile Glu Ala Asn Leu Leu Trp Arg Gln Glu Met Gly Gly Asn						
2225		2230		2235		2240
Ile Thr Arg Val Glu Ser Glu Asn Lys Val Val Ile Leu Asp Ser Phe						
	2245		2250		2255	
Asp Pro Leu Val Ala Glu Glu Asp Glu Arg Glu Val Ser Val Pro Ala						
	2260		2265		2270	

Glu Ile Leu Arg Lys Ser Arg Arg Phe Ala Pro Ala Leu Pro Val Trp
 2275 2280 2285
 Ala Arg Pro Asp Tyr Asn Pro Leu Leu Val Glu Thr Trp Lys Lys Pro
 2290 2295 2300
 Asp Tyr Glu Pro Pro Val Val His Gly Cys Pro Leu Pro Pro Pro Arg
 2305 2310 2315 2320
 Ser Pro Pro Val Pro Pro Pro Arg Lys Lys Arg Thr Val Val Leu Thr
 2325 2330 2335
 Glu Ser Thr Leu Pro Thr Ala Leu Ala Glu Leu Ala Thr Lys Ser Phe
 2340 2345 2350
 Gly Ser Ser Ser Thr Ser Gly Ile Thr Gly Asp Asn Thr Thr Thr Ser
 2355 2360 2365
 Ser Glu Pro Ala Pro Ser Gly Cys Pro Pro Asp Ser Asp Val Glu Ser
 2370 2375 2380
 Tyr Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu
 2385 2390 2395 2400
 Ser Asp Gly Ser Trp Ser Thr Val Ser Ser Gly Ala Asp Thr Glu Asp
 2405 2410 2415
 Val Val Cys Cys Ser Met Ser Tyr Ser Trp Thr Gly Ala Leu Val Thr
 2420 2425 2430
 Pro Cys Ala Ala Glu Glu Gln Lys Leu Pro Ile Asn Ala Leu Ser Asn
 2435 2440 2445
 Ser Leu Leu Arg His His Asn Leu Val Tyr Ser Thr Thr Ser Arg Ser
 2450 2455 2460
 Ala Cys Gln Arg Lys Lys Lys Val Thr Phe Asp Arg Leu Gln Val Leu
 2465 2470 2475 2480
 Asp Ser His Tyr Gln Asp Val Leu Lys Glu Val Lys Ala Ala Ala Ser
 2485 2490 2495
 Lys Val Lys Ala Asn Leu Leu Ser Val Glu Glu Ala Cys Ser Leu Ala
 2500 2505 2510
 Pro Pro His Ser Ala Lys Ser Lys Phe Gly Tyr Gly Ala Lys Asp Val
 2515 2520 2525
 Arg Cys His Ala Arg Lys Ala Val Ala His Ile Asn Ser Val Trp Lys
 2530 2535 2540
 Asp Leu Leu Glu Asp Ser Val Thr Pro Ile Asp Thr Thr Ile Met Ala
 2545 2550 2555 2560
 Lys Asn Glu Val Phe Cys Val Gln Pro Glu Lys Gly Gly Arg Lys Pro
 2565 2570 2575
 Ala Arg Leu Ile Val Phe Pro Asp Leu Gly Val Arg Val Cys Glu Lys
 2580 2585 2590
 Met Ala Leu Tyr Asp Val Val Ser Lys Leu Pro Leu Ala Val Met Gly
 2595 2600 2605
 Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly Gln Arg Val Glu Phe Leu
 2610 2615 2620
 Val Gln Ala Trp Lys Ser Lys Lys Thr Pro Met Gly Leu Ser Tyr Asp
 2625 2630 2635 2640
 Thr Arg Cys Phe Asp Ser Thr Val Thr Glu Ser Asp Ile Arg Thr Glu
 2645 2650 2655
 Glu Ala Ile Tyr Gln Cys Cys Asp Leu Asp Pro Gln Ala Arg Val Ala
 2660 2665 2670
 Ile Lys Ser Leu Thr Glu Arg Leu Tyr Val Gly Gly Pro Leu Thr Asn
 2675 2680 2685
 Ser Arg Gly Glu Asn Cys Gly Tyr Arg Arg Cys Arg Ala Ser Arg Val
 2690 2695 2700
 Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr Arg Tyr Ile Lys Ala Arg

2705		2710		2715		2720
Ala Ala Cys Arg	Ala Ala Gly Leu Gln Asp Cys Thr Met Leu Val Cys					
	2725		2730		2735	
Gly Asp Asp Leu Val Val Ile Cys Glu Ser Ala Gly Val Gln Glu Asp						
	2740		2745		2750	
Ala Ala Ser Leu Arg Ala Phe Thr Glu Ala Met Thr Arg Tyr Ser Ala						
	2755		2760		2765	
Pro Pro Gly Asp Pro Pro Gln Pro Glu Tyr Asp Leu Glu Leu Ile Thr						
	2770		2775		2780	
Ser Cys Ser Ser Asn Val Ser Val Ala His Asp Gly Ala Gly Lys Arg						
2785		2790		2795		2800
Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr Pro Leu Ala Arg Ala Ala						
	2805		2810		2815	
Trp Glu Thr Ala Arg His Thr Pro Val Asn Ser Trp Leu Gly Asn Ile						
	2820		2825		2830	
Ile Met Phe Ala Pro Thr Leu Trp Ala Arg Met Ile Leu Met Thr His						
	2835		2840		2845	
Phe Phe Ser Val Leu Ile Ala Arg Asp Gln Leu Glu Gln Ala Leu Asn						
	2850		2855		2860	
Cys Glu Ile Tyr Gly Ala Cys Tyr Ser Ile Glu Pro Leu Asp Leu Pro						
2865		2870		2875		2880
Pro Ile Ile Gln Arg Leu His Gly Leu Ser Ala Phe Ser Leu His Ser						
	2885		2890		2895	
Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala Ala Cys Leu Arg Lys Leu						
	2900		2905		2910	
Gly Val Pro Pro Leu Arg Ala Trp Arg His Arg Ala Trp Ser Val Arg						
	2915		2920		2925	
Ala Arg Leu Leu Ala Arg Gly Gly Lys Ala Ala Ile Cys Gly Lys Tyr						
	2930		2935		2940	
Leu Phe Asn Trp Ala Val Arg Thr Lys Leu Lys Leu Thr Pro Ile Thr						
2945		2950		2955		2960
Ala Ala Gly Arg Leu Asp Leu Ser Gly Trp Phe Thr Ala Gly Tyr Ser						
	2965		2970		2975	
Gly Gly Asp Ile Tyr His Ser Val Ser His Ala Arg Pro Arg Trp Phe						
	2980		2985		2990	
Trp Phe Cys Leu Leu Leu Leu Ala Ala Gly Val Gly Ile Tyr Leu Leu						
	2995		3000		3005	
Pro Asn Arg						
3010						

<210> 2

<211> 182

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus core protein sequence

<400> 2

Met Ser Thr Asn Pro Lys Pro Gln Arg Lys Thr Lys Arg Asn Thr Asn																
1		5		10		15										
Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly																
	20		25		30											
Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala																

<210> 4

<211> 350

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus E2 protein sequence

<400> 4

Gly	Val	Asp	Ala	Glu	Thr	His	Val	Thr	Gly	Gly	Asn	Ala	Gly	Arg	Thr	1	5	10	15
Thr	Ala	Gly	Leu	Val	Gly	Leu	Leu	Thr	Pro	Gly	Ala	Lys	Gln	Asn	Ile	20	25	30	
Gln	Leu	Ile	Asn	Thr	Asn	Gly	Ser	Trp	His	Ile	Asn	Ser	Thr	Ala	Leu	35	40	45	
Asn	Cys	Asn	Glu	Ser	Leu	Asn	Thr	Gly	Trp	Leu	Ala	Gly	Leu	Phe	Tyr	50	55	60	
Gln	His	Lys	Phe	Asn	Ser	Ser	Gly	Cys	Pro	Glu	Arg	Leu	Ala	Ser	Cys	65	70	75	80
Arg	Arg	Leu	Thr	Asp	Phe	Ala	Gln	Gly	Trp	Gly	Pro	Ile	Ser	Tyr	Ala	85	90	95	
Asn	Gly	Ser	Gly	Leu	Asp	Glu	Arg	Pro	Tyr	Cys	Trp	His	Tyr	Pro	Pro	100	105	110	
Arg	Pro	Cys	Gly	Ile	Val	Pro	Ala	Lys	Ser	Val	Cys	Gly	Pro	Val	Tyr	115	120	125	
Cys	Phe	Thr	Pro	Ser	Pro	Val	Val	Val	Gly	Thr	Thr	Asp	Arg	Ser	Gly	130	135	140	
Ala	Pro	Thr	Tyr	Ser	Trp	Gly	Ala	Asn	Asp	Thr	Asp	Val	Phe	Val	Leu	145	150	155	160
Asn	Asn	Thr	Arg	Pro	Pro	Leu	Gly	Asn	Trp	Phe	Gly	Cys	Thr	Trp	Met	165	170	175	
Asn	Ser	Thr	Gly	Phe	Thr	Lys	Val	Cys	Gly	Ala	Pro	Pro	Cys	Val	Ile	180	185	190	
Gly	Gly	Val	Gly	Asn	Asn	Thr	Leu	Leu	Cys	Pro	Thr	Asp	Cys	Phe	Arg	195	200	205	
Lys	Tyr	Pro	Glu	Ala	Thr	Tyr	Ser	Arg	Cys	Gly	Ser	Gly	Pro	Arg	Ile	210	215	220	
Thr	Pro	Arg	Cys	Met	Val	Asp	Tyr	Pro	Tyr	Arg	Leu	Trp	His	Tyr	Pro	225	230	235	240
Cys	Thr	Ile	Asn	Tyr	Thr	Ile	Phe	Lys	Val	Arg	Met	Tyr	Val	Gly	Gly	245	250	255	
Val	Glu	His	Arg	Leu	Glu	Ala	Ala	Cys	Asn	Trp	Thr	Arg	Gly	Glu	Arg	260	265	270	
Cys	Asp	Leu	Glu	Asp	Arg	Asp	Arg	Ser	Glu	Leu	Ser	Pro	Leu	Leu	Leu	275	280	285	
Ser	Thr	Thr	Gln	Trp	Gln	Val	Leu	Pro	Cys	Ser	Phe	Thr	Thr	Leu	Pro	290	295	300	
Ala	Leu	Ser	Thr	Gly	Leu	Ile	His	Leu	His	Gln	Asn	Ile	Val	Asp	Val	305	310	315	320
Gln	Tyr	Leu	Tyr	Gly	Val	Gly	Ser	Ser	Ile	Ala	Ser	Trp	Ala	Ile	Lys	325	330	335	
Trp	Glu	Tyr	Val	Val	Leu	Leu	Phe	Leu	Leu	Leu	Ala	Asp	Ala						

<210> 5

<211> 315

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus NS2 protein sequence

<400> 5

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Arg Val Cys Ser Cys Leu Trp Met Met Leu Leu Ile Ser Gln Ala Glu
 1           5           10           15
Ala Ala Leu Glu Asn Leu Val Ile Leu Asn Ala Ala Ser Leu Ala Gly
      20           25           30
Thr His Gly Leu Val Ser Phe Leu Val Phe Phe Cys Phe Ala Trp Tyr
      35           40           45
Leu Lys Gly Arg Trp Val Pro Gly Ala Val Tyr Ala Leu Tyr Gly Met
      50           55           60
Trp Pro Leu Leu Leu Leu Leu Leu Ala Leu Pro Gln Arg Ala Tyr Ala
      65           70           75           80
Leu Asp Thr Glu Val Ala Ala Ser Cys Gly Gly Val Val Leu Val Gly
      85           90           95
Leu Met Ala Leu Thr Leu Ser Pro Tyr Tyr Lys Arg Tyr Ile Ser Trp
      100          105          110
Cys Met Trp Trp Leu Gln Tyr Phe Leu Thr Arg Val Glu Ala Gln Leu
      115          120          125
His Val Trp Val Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val
      130          135          140
Ile Leu Leu Thr Cys Val Val His Pro Ala Leu Val Phe Asp Ile Thr
      145          150          155          160
Lys Leu Leu Leu Ala Ile Phe Gly Pro Leu Trp Ile Leu Gln Ala Ser
      165          170          175
Leu Leu Lys Val Pro Tyr Phe Val Arg Val Gln Gly Leu Leu Arg Ile
      180          185          190
Cys Ala Leu Ala Arg Lys Ile Ala Gly Gly His Tyr Val Gln Met Ala
      195          200          205
Ile Ile Lys Leu Gly Ala Leu Thr Gly Thr Cys Val Tyr Asn His Leu
      210          215          220
Ala Pro Leu Arg Asp Trp Ala His Asn Gly Leu Arg Asp Leu Ala Val
      225          230          235          240
Ala Val Glu Pro Val Val Phe Ser Arg Met Glu Thr Lys Leu Ile Thr
      245          250          255
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Asn Gly Leu Pro
      260          265          270
Val Ser Ala Arg Arg Gly Gln Glu Ile Leu Leu Gly Pro Ala Asp Gly
      275          280          285
Met Val Ser Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala
      290          295          300
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile
      305          310          315

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<210> 6

<211> 613
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hepatitis C virus NS3 protein sequence

<400> 6

Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly	Glu	Val	Gln
1				5					10					15	
Ile	Val	Ser	Thr	Ala	Thr	Gln	Thr	Phe	Leu	Ala	Thr	Cys	Ile	Asn	Gly
			20					25					30		
Val	Cys	Trp	Thr	Val	Tyr	His	Gly	Ala	Gly	Thr	Arg	Thr	Ile	Ala	Ser
	35						40					45			
Pro	Lys	Gly	Pro	Val	Ile	Gln	Thr	Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu
	50					55					60				
Val	Gly	Trp	Pro	Ala	Pro	Gln	Gly	Ser	Arg	Ser	Leu	Thr	Pro	Cys	Thr
65				70					75					80	
Cys	Gly	Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala	Asp	Val	Ile
				85					90					95	
Pro	Val	Arg	Arg	Arg	Gly	Asp	Ser	Arg	Gly	Ser	Leu	Leu	Ser	Pro	Arg
			100					105					110		
Pro	Ile	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	Leu	Cys	Pro
	115					120						125			
Thr	Gly	His	Ala	Val	Gly	Leu	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly
	130					135					140				
Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Asn	Leu	Glu	Thr	Thr
145					150					155				160	
Met	Arg	Ser	Pro	Val	Phe	Thr	Asp	Asn	Ser	Ser	Pro	Pro	Ala	Val	Pro
				165					170					175	
Gln	Ser	Phe	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	Gly	Ser	Gly	Lys
			180					185					190		
Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Lys	Gly	Tyr	Lys	Val	Leu
	195						200					205			
Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Leu	Gly	Phe	Gly	Ala	Tyr	Met
	210					215					220				
Ser	Lys	Ala	His	Gly	Val	Asp	Pro	Asn	Ile	Arg	Thr	Gly	Val	Arg	Thr
225				230						235				240	
Ile	Thr	Thr	Gly	Ser	Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly	Lys	Phe	Leu
			245					250						255	
Ala	Asp	Ala	Gly	Cys	Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile	Ile	Cys	Asp
			260					265					270		
Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Ser	Gly	Ile	Gly	Thr	Val
	275					280						285			
Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	Val	Val	Leu	Ala	Thr
	290					295					300				
Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Ser	His	Pro	Asn	Ile	Glu	Glu
305				310						315				320	
Val	Ala	Leu	Ser	Thr	Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly	Lys	Ala	Ile
			325					330						335	
Pro	Leu	Glu	Val	Ile	Lys	Gly	Gly	Arg	His	Leu	Ile	Phe	Cys	His	Ser
			340					345					350		
Lys	Lys	Lys	Cys	Asp	Glu	Leu	Ala	Ala	Lys	Leu	Val	Ala	Leu	Gly	Ile
		355				360						365			
Asn	Ala	Val	Ala	Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	Ile	Pro	Thr

370		375		380	
Ser Gly Asp Val Val Val Val Ser Thr Asp Ala Leu Met Thr Gly Phe					
385		390		395	400
Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln					
	405		410		415
Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Thr					
	420		425		430
Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr Gly					
	435		440		445
Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu Arg Pro					
	450		455		460
Ser Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly					
465		470		475	480
Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr Val Arg Leu Arg					
	485		490		495
Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu Gly					
	500		505		510
Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp Ala His Phe					
	515		520		525
Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Phe Pro Tyr Leu Val Ala					
	530		535		540
Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp					
545		550		555	560
Asp Gln Met Arg Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly					
	565		570		575
Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr					
	580		585		590
Leu Thr His Pro Ile Thr Lys Tyr Ile Met Thr Cys Met Ser Ala Asp					
	595		600		605
Leu Glu Val Val Thr					
610					

<210> 7

<211> 54

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus NS4A protein sequence

<400> 7

Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr				
1	5	10	15	
Cys Leu Ser Thr Gly Cys Val Val Ile Val Gly Arg Ile Val Leu Ser				
	20	25	30	
Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Gln Glu Phe				
	35	40	45	
Asp Glu Met Glu Glu Cys				
50				

<210> 8

<211> 260

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus NS4B protein sequence

<400> 8

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Ser Gln His Leu Pro Tyr Ile Glu Gln Gly Met Met Leu Ala Glu Gln
 1              5              10              15
Phe Lys Gln Lys Ala Leu Gly Leu Leu Gln Thr Ala Ser Arg His Ala
      20              25              30
Glu Val Ile Thr Pro Ala Val Gln Thr Asn Trp Gln Lys Leu Glu Val
      35              40              45
Phe Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile Gln Tyr Leu
      50              55              60
Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala Ser Leu Met
65              70              75              80
Ala Phe Thr Ala Ala Val Thr Ser Pro Leu Thr Thr Gly Gln Thr Leu
      85              90              95
Leu Phe Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu Ala Ala Pro
      100             105             110
Gly Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly Ala Ala Leu
      115             120             125
Asp Ser Val Gly Leu Gly Lys Val Leu Val Asp Ile Leu Ala Gly Tyr
      130             135             140
Gly Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile Met Ser Gly
145             150             155             160
Glu Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro Ala Ile Leu
      165             170             175
Ser Pro Gly Ala Leu Ala Val Gly Val Val Phe Ala Ser Ile Leu Arg
      180             185             190
Arg Arg Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met Asn Arg Leu
      195             200             205
Ile Ala Phe Ala Ser Arg Gly Asn His Val Ser Pro Thr His Tyr Val
      210             215             220
Pro Glu Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu Ser Ser Leu
225             230             235             240
Thr Val Thr Gln Leu Leu Arg Arg Leu His Gln Trp Ile Ser Ser Glu
      245             250             255
Cys Thr Thr Pro
      260
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<210> 9

<211> 1040

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus NS5A/B protein sequence

<400> 9

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Cys Ser Gly Ser Trp Leu Arg Asp Ile Trp Asp Trp Ile Cys Glu Val
 1              5              10              15
Leu Ser Asp Phe Lys Thr Trp Leu Lys Ala Lys Leu Met Pro Gln Leu
      20              25              30
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Pro Gly Ile Pro Phe Val Ser Cys Gln Arg Gly Tyr Arg Gly Val Trp
 35 40 45
 Arg Gly Asp Gly Ile Met His Thr Arg Cys His Cys Gly Ala Glu Ile
 50 55 60
 Thr Gly His Val Lys Asn Gly Thr Met Arg Ile Val Gly Pro Arg Thr
 65 70 75 80
 Cys Lys Asn Met Trp Ser Gly Thr Phe Phe Ile Asn Ala Tyr Thr Thr
 85 90 95
 Gly Pro Cys Thr Pro Leu Pro Ala Pro Asn Tyr Lys Phe Ala Leu Trp
 100 105 110
 Arg Val Ser Ala Glu Glu Tyr Val Glu Ile Arg Arg Val Gly Asp Phe
 115 120 125
 His Tyr Val Ser Gly Met Thr Thr Asp Asn Leu Lys Cys Pro Cys Gln
 130 135 140
 Ile Pro Ser Pro Glu Phe Phe Thr Glu Leu Asp Gly Val Arg Leu His
 145 150 155 160
 Arg Phe Ala Pro Pro Cys Lys Pro Leu Leu Arg Glu Glu Val Ser Phe
 165 170 175
 Arg Val Gly Leu His Glu Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu
 180 185 190
 Pro Glu Pro Asp Val Ala Val Leu Thr Ser Met Leu Thr Asp Pro Ser
 195 200 205
 His Ile Thr Ala Glu Ala Ala Gly Arg Arg Leu Ala Arg Gly Ser Pro
 210 215 220
 Pro Ser Met Ala Ser Ser Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu
 225 230 235 240
 Lys Ala Thr Cys Thr Ala Asn His Asp Ser Pro Asp Ala Glu Leu Ile
 245 250 255
 Glu Ala Asn Leu Leu Trp Arg Gln Glu Met Gly Gly Asn Ile Thr Arg
 260 265 270
 Val Glu Ser Glu Asn Lys Val Val Ile Leu Asp Ser Phe Asp Pro Leu
 275 280 285
 Val Ala Glu Glu Asp Glu Arg Glu Val Ser Val Pro Ala Glu Ile Leu
 290 295 300
 Arg Lys Ser Arg Arg Phe Ala Pro Ala Leu Pro Val Trp Ala Arg Pro
 305 310 315 320
 Asp Tyr Asn Pro Leu Leu Val Glu Thr Trp Lys Lys Pro Asp Tyr Glu
 325 330 335
 Pro Pro Val Val His Gly Cys Pro Leu Pro Pro Pro Arg Ser Pro Pro
 340 345 350
 Val Pro Pro Pro Arg Lys Lys Arg Thr Val Val Leu Thr Glu Ser Thr
 355 360 365
 Leu Pro Thr Ala Leu Ala Glu Leu Ala Thr Lys Ser Phe Gly Ser Ser
 370 375 380
 Ser Thr Ser Gly Ile Thr Gly Asp Asn Thr Thr Thr Ser Ser Glu Pro
 385 390 395 400
 Ala Pro Ser Gly Cys Pro Pro Asp Ser Asp Val Glu Ser Tyr Ser Ser
 405 410 415
 Met Pro Pro Leu Glu Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly
 420 425 430
 Ser Trp Ser Thr Val Ser Ser Gly Ala Asp Thr Glu Asp Val Val Cys
 435 440 445
 Cys Ser Met Ser Tyr Ser Trp Thr Gly Ala Leu Val Thr Pro Cys Ala
 450 455 460
 Ala Glu Glu Gln Lys Leu Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu

465					470					475					480
Arg	His	His	Asn	Leu	Val	Tyr	Ser	Thr	Thr	Ser	Arg	Ser	Ala	Cys	Gln
				485					490					495	
Arg	Lys	Lys	Lys	Val	Thr	Phe	Asp	Arg	Leu	Gln	Val	Leu	Asp	Ser	His
			500					505					510		
Tyr	Gln	Asp	Val	Leu	Lys	Glu	Val	Lys	Ala	Ala	Ala	Ser	Lys	Val	Lys
		515					520					525			
Ala	Asn	Leu	Leu	Ser	Val	Glu	Glu	Ala	Cys	Ser	Leu	Ala	Pro	Pro	His
	530					535					540				
Ser	Ala	Lys	Ser	Lys	Phe	Gly	Tyr	Gly	Ala	Lys	Asp	Val	Arg	Cys	His
545					550					555				560	
Ala	Arg	Lys	Ala	Val	Ala	His	Ile	Asn	Ser	Val	Trp	Lys	Asp	Leu	Leu
			565					570					575		
Glu	Asp	Ser	Val	Thr	Pro	Ile	Asp	Thr	Thr	Ile	Met	Ala	Lys	Asn	Glu
			580					585					590		
Val	Phe	Cys	Val	Gln	Pro	Glu	Lys	Gly	Gly	Arg	Lys	Pro	Ala	Arg	Leu
		595					600					605			
Ile	Val	Phe	Pro	Asp	Leu	Gly	Val	Arg	Val	Cys	Glu	Lys	Met	Ala	Leu
	610					615					620				
Tyr	Asp	Val	Val	Ser	Lys	Leu	Pro	Leu	Ala	Val	Met	Gly	Ser	Ser	Tyr
625					630					635				640	
Gly	Phe	Gln	Tyr	Ser	Pro	Gly	Gln	Arg	Val	Glu	Phe	Leu	Val	Gln	Ala
			645						650				655		
Trp	Lys	Ser	Lys	Lys	Thr	Pro	Met	Gly	Leu	Ser	Tyr	Asp	Thr	Arg	Cys
		660						665				670			
Phe	Asp	Ser	Thr	Val	Thr	Glu	Ser	Asp	Ile	Arg	Thr	Glu	Glu	Ala	Ile
	675					680					685				
Tyr	Gln	Cys	Cys	Asp	Leu	Asp	Pro	Gln	Ala	Arg	Val	Ala	Ile	Lys	Ser
	690					695					700				
Leu	Thr	Glu	Arg	Leu	Tyr	Val	Gly	Gly	Pro	Leu	Thr	Asn	Ser	Arg	Gly
705					710					715				720	
Glu	Asn	Cys	Gly	Tyr	Arg	Arg	Cys	Arg	Ala	Ser	Arg	Val	Leu	Thr	Thr
			725						730				735		
Ser	Cys	Gly	Asn	Thr	Leu	Thr	Arg	Tyr	Ile	Lys	Ala	Arg	Ala	Ala	Cys
		740						745				750			
Arg	Ala	Ala	Gly	Leu	Gln	Asp	Cys	Thr	Met	Leu	Val	Cys	Gly	Asp	Asp
	755					760					765				
Leu	Val	Val	Ile	Cys	Glu	Ser	Ala	Gly	Val	Gln	Glu	Asp	Ala	Ala	Ser
	770					775					780				
Leu	Arg	Ala	Phe	Thr	Glu	Ala	Met	Thr	Arg	Tyr	Ser	Ala	Pro	Pro	Gly
785					790					795				800	
Asp	Pro	Pro	Gln	Pro	Glu	Tyr	Asp	Leu	Glu	Leu	Ile	Thr	Ser	Cys	Ser
			805					810					815		
Ser	Asn	Val	Ser	Val	Ala	His	Asp	Gly	Ala	Gly	Lys	Arg	Val	Tyr	Tyr
		820						825					830		
Leu	Thr	Arg	Asp	Pro	Thr	Thr	Pro	Leu	Ala	Arg	Ala	Ala	Trp	Glu	Thr
	835						840				845				
Ala	Arg	His	Thr	Pro	Val	Asn	Ser	Trp	Leu	Gly	Asn	Ile	Ile	Met	Phe
	850					855				860					
Ala	Pro	Thr	Leu	Trp	Ala	Arg	Met	Ile	Leu	Met	Thr	His	Phe	Phe	Ser
865					870				875					880	
Val	Leu	Ile	Ala	Arg	Asp	Gln	Leu	Glu	Gln	Ala	Leu	Asn	Cys	Glu	Ile
			885					890					895		
Tyr	Gly	Ala	Cys	Tyr	Ser	Ile	Glu	Pro	Leu	Asp	Leu	Pro	Pro	Ile	Ile
		900					905					910			

Gln Arg Leu His Gly Leu Ser Ala Phe Ser Leu His Ser Tyr Ser Pro
 915 920 925
 Gly Glu Ile Asn Arg Val Ala Ala Cys Leu Arg Lys Leu Gly Val Pro
 930 935 940
 Pro Leu Arg Ala Trp Arg His Arg Ala Trp Ser Val Arg Ala Arg Leu
 945 950 955 960
 Leu Ala Arg Gly Gly Lys Ala Ala Ile Cys Gly Lys Tyr Leu Phe Asn
 965 970 975
 Trp Ala Val Arg Thr Lys Leu Lys Leu Thr Pro Ile Thr Ala Ala Gly
 980 985 990
 Arg Leu Asp Leu Ser Gly Trp Phe Thr Ala Gly Tyr Ser Gly Gly Asp
 995 1000 1005
 Ile Tyr His Ser Val Ser His Ala Arg Pro Arg Trp Phe Trp Phe Cys
 1010 1015 1020
 Leu Leu Leu Leu Ala Ala Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg
 1025 1030 1035 1040

<210> 10

<211> 226

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis B virus S antigen (HBsAg) sequence

<400> 10

Met Glu Asn Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln
 1 5 10 15
 Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu
 20 25 30
 Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Thr Val Cys
 35 40 45
 Leu Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser
 50 55 60
 Cys Pro Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe
 65 70 75 80
 Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val
 85 90 95
 Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly
 100 105 110
 Ser Ser Thr Thr Ser Thr Gly Pro Cys Arg Thr Cys Met Thr Thr Ala
 115 120 125
 Gln Gly Thr Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp
 130 135 140
 Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Gly Lys
 145 150 155 160
 Phe Leu Trp Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu Ser Leu Leu
 165 170 175
 Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu
 180 185 190
 Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile
 195 200 205
 Leu Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val
 210 215 220

Tyr Ile
225

<210> 11
<211> 212
<212> PRT
<213> Artificial Sequence

<220>
<223> Hepatitis B virus C antigen and e antigen
(HBcAg/HBeAg) sequence

<400> 11
Met Gln Leu Phe His Leu Cys Leu Ile Ile Ser Cys Ser Cys Pro Thr
1 5 10 15
Val Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Gly Met Asp Ile
20 25 30
Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu
35 40 45
Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser
50 55 60
Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His
65 70 75 80
His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Thr
85 90 95
Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp Pro Ala Ser Arg Asp
100 105 110
Leu Val Val Ser Tyr Val Asn Thr Asn Met Gly Leu Lys Phe Arg Gln
115 120 125
Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val
130 135 140
Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala
145 150 155 160
Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr
165 170 175
Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro
180 185 190
Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg
195 200 205
Glu Ser Gln Cys
210

<210> 12
<211> 2227
<212> PRT
<213> Artificial Sequence

<220>
<223> Hepatitis A virus sequence

<400> 12
Met Asn Met Ser Lys Gln Gly Ile Phe Gln Thr Val Gly Ser Gly Leu
1 5 10 15

Asp	His	Ile	Leu	Ser	Leu	Ala	Asp	Ile	Glu	Glu	Glu	Gln	Met	Ile	Gln	20	25	30
Ser	Val	Asp	Arg	Thr	Ala	Val	Thr	Gly	Ala	Ser	Tyr	Phe	Thr	Ser	Val	35	40	45
Asp	Gln	Ser	Ser	Val	His	Thr	Ala	Glu	Val	Gly	Ser	His	Gln	Ile	Glu	50	55	60
Pro	Leu	Lys	Thr	Ser	Val	Asp	Lys	Pro	Gly	Ser	Lys	Lys	Thr	Gln	Gly	65	70	75
Glu	Lys	Phe	Phe	Leu	Ile	His	Ser	Ala	Asp	Trp	Leu	Thr	Thr	His	Ala	85	90	95
Leu	Phe	His	Glu	Val	Ala	Lys	Leu	Asp	Val	Val	Lys	Leu	Leu	Tyr	Asn	100	105	110
Glu	Gln	Phe	Ala	Val	Gln	Gly	Leu	Leu	Arg	Tyr	His	Thr	Tyr	Ala	Arg	115	120	125
Phe	Gly	Ile	Glu	Ile	Gln	Val	Gln	Ile	Asn	Pro	Thr	Pro	Phe	Gln	Gln	130	135	140
Gly	Gly	Leu	Ile	Cys	Ala	Met	Val	Pro	Gly	Asp	Gln	Ser	Tyr	Gly	Ser	145	150	155
Ile	Ala	Ser	Leu	Thr	Val	Tyr	Pro	His	Gly	Leu	Leu	Asn	Cys	Asn	Ile	165	170	175
Asn	Asn	Val	Val	Arg	Ile	Lys	Val	Pro	Phe	Ile	Tyr	Thr	Arg	Gly	Ala	180	185	190
Tyr	His	Phe	Lys	Asp	Pro	Gln	Tyr	Pro	Val	Trp	Glu	Leu	Thr	Ile	Arg	195	200	205
Val	Trp	Ser	Glu	Leu	Asn	Ile	Gly	Thr	Gly	Thr	Ser	Ala	Tyr	Thr	Ser	210	215	220
Leu	Asn	Val	Leu	Ala	Arg	Phe	Thr	Asp	Leu	Glu	Leu	His	Gly	Leu	Thr	225	230	235
Pro	Leu	Ser	Thr	Gln	Met	Met	Arg	Asn	Glu	Phe	Arg	Val	Ser	Thr	Thr	245	250	255
Glu	Asn	Val	Val	Asn	Leu	Ser	Asn	Tyr	Glu	Asp	Ala	Arg	Ala	Lys	Met	260	265	270
Ser	Phe	Ala	Leu	Asp	Gln	Glu	Asp	Trp	Lys	Ser	Asp	Pro	Ser	Gln	Gly	275	280	285
Gly	Gly	Ile	Lys	Ile	Thr	His	Phe	Thr	Thr	Trp	Thr	Ser	Ile	Pro	Thr	290	295	300
Leu	Ala	Ala	Gln	Phe	Pro	Phe	Asn	Ala	Ser	Asp	Ser	Val	Gly	Gln	Gln	305	310	315
Ile	Lys	Val	Ile	Pro	Val	Asp	Pro	Tyr	Phe	Phe	Gln	Met	Thr	Asn	Thr	325	330	335
Asn	Pro	Asp	Gln	Lys	Cys	Ile	Thr	Ala	Leu	Ala	Ser	Ile	Cys	Gln	Met	340	345	350
Phe	Cys	Phe	Trp	Arg	Gly	Asp	Leu	Val	Phe	Asp	Phe	Gln	Val	Phe	Pro	355	360	365
Thr	Lys	Tyr	His	Ser	Gly	Arg	Leu	Leu	Phe	Cys	Phe	Val	Pro	Gly	Asn	370	375	380
Glu	Leu	Ile	Asp	Val	Thr	Gly	Ile	Thr	Leu	Lys	Gln	Ala	Thr	Thr	Ala	385	390	395
Pro	Cys	Ala	Val	Met	Asp	Ile	Thr	Gly	Val	Gln	Ser	Thr	Leu	Arg	Phe	405	410	415
Arg	Val	Pro	Trp	Ile	Ser	Asp	Thr	Pro	Tyr	Arg	Val	Asn	Arg	Tyr	Thr	420	425	430
Lys	Ser	Ala	His	Gln	Lys	Gly	Glu	Tyr	Thr	Ala	Ile	Gly	Lys	Leu	Ile	435	440	445
Val	Tyr	Cys	Tyr	Asn	Arg	Leu	Thr	Ser	Pro	Ser	Asn	Val	Ala	Ser	His			

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Val	Arg	Val	Asn	Val	Tyr	Leu	Ser	Ala	Ile	Asn	Leu	Glu	Cys	Phe	Ala		
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Pro	Leu	Tyr	His	Ala	Met	Asp	Val	Thr	Thr	Gln	Val	Gly	Asp	Asp	Ser		
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Gln	Val	Gly	Ile	Thr	Thr	Met	Arg	Asp	Leu	Lys	Gly	Lys	Ala	Asn	Arg		
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Gly	Lys	Met	Asp	Val	Ser	Gly	Val	Gln	Ala	Pro	Arg	Gly	Ser	Tyr	Gln		
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Gln	Gln	Leu	Asn	Asp	Pro	Val	Leu	Ala	Lys	Lys	Val	Pro	Glu	Thr	Phe		
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Pro	Glu	Leu	Lys	Pro	Gly	Glu	Ser	Arg	His	Thr	Ser	Asp	His	Met	Ser		
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Ile	Tyr	Lys	Phe	Met	Gly	Arg	Ser	His	Phe	Leu	Cys	Thr	Phe	Thr	Phe		
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Asn	Ser	Asn	Asn	Lys	Glu	Tyr	Thr	Phe	Pro	Ile	Thr	Leu	Ser	Ser	Thr		
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Leu	Phe	Gln	Leu	Tyr	Arg	Gly	Pro	Leu	Asp	Leu	Thr	Ile	Ile	Ile	Thr		
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Gly	Ala	Thr	Asp	Val	Asp	Gly	Met	Ala	Trp	Phe	Thr	Pro	Val	Gly	Leu		
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Lys	Thr	Ala	Leu	Gly	Ala	Val	Arg	Phe	Asn	Thr	Arg	Arg	Thr	Gly	Asn		
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Glu	Met	Asp	Ala	Gly	Val	Leu	Thr	Gly	Arg	Leu	Ile	Arg	Leu	Asn	Asp		
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Met	Ser	Glu	Thr	Asp	Leu	Cys	Phe	Leu	Leu	His	Trp	Leu	Asn	Pro	Lys		
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Glu Glu Glu Pro Ile Pro Ala Glu Gly Val Tyr His Gly Val Thr Lys			
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Val Gly Glu Lys Asn Gly Cys Val Arg Trp Val Met Asn Ala Leu Gly			
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Val Lys Asp Asp Trp Leu Leu Val Pro Ser His Ala Tyr Lys Phe Glu			
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Ile Ser Glu Gly Pro Leu Lys Met Glu Glu Lys Ala Thr Tyr Val His			
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Lys Lys Asn Asp Gly Thr Thr Val Asp Leu Thr Val Asp Gln Ala Trp			
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2215

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<223> Hepatitis A virus sequence

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<211> 2061

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<210> 17

<211> 686

<212> PRT

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<223> Hepatitis C virus NS3/4A peptide

<400> 17

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305				310						315					320
Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn
				325					330					335	
Ile	Glu	Glu	Val	Ala	Leu	Ser	Thr	Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly
			340					345					350		
Lys	Ala	Ile	Pro	Leu	Glu	Ala	Ile								

Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Glu
 435 440 445
 Thr Ile Thr Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly
 450 455 460
 Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly
 465 470 475 480
 Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys Tyr
 485 490 495
 Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr Val
 500 505 510
 Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp
 515 520 525
 His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp
 530 535 540
 Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Leu Pro Tyr
 545 550 555 560
 Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro
 565 570 575
 Pro Ser Trp Asp Gln Met Trp Lys Cys Leu Ile Arg Leu Lys Pro Thr
 580 585 590
 Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn
 595 600 605
 Glu Val Thr Leu Thr His Pro Val Thr Lys Tyr Ile Met Thr Cys Met
 610 615 620
 Ser Ala Asp Leu Glu Val Val Thr
 625 630

<210> 30

<211> 54

<212> PRT

<213> Artificial Sequence

<220>

<223> Hepatitis C virus NS4A peptide

<400> 30

Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr
 1 5 10 15
 Cys Leu Ser Thr Gly Cys Val Val Ile Val Gly Arg Ile Val Leu Ser
 20 25 30
 Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe
 35 40 45
 Asp Glu Met Glu Glu Cys
 50

<210> 31

<211> 686

<212> PRT

<213> Artificial Sequence

<220>

<223> Mutant Hepatitis C virus NS3/4A

Met	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly
1				5					10					15	
Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly
			20					25					30		
Glu	Val	Gln	Ile	Val	Ser	Thr	Ala	Ala	Gln	Thr	Phe	Leu	Ala	Thr	Cys
		35					40					45			
Ile	Asn	Gly	Val	Cys	Trp	Thr	Val	Tyr	His	Gly	Ala	Gly	Thr	Arg	Thr
	50					55				60					
Ile	Ala	Ser	Pro	Lys	Gly	Pro	Val	Ile	Gln	Met	Tyr	Thr	Asn	Val	Asp
65				70					75						80
Gln	Asp	Leu	Val	Gly	Trp	Pro	Ala	Pro	Gln	Gly	Ala	Arg	Ser	Leu	Thr
			85					90					95		
Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala
			100				105					110			
Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	Gly	Asp	Gly	Arg	Gly	Ser	Leu	Leu
		115					120				125				
Ser	Pro	Arg	Pro	Ile	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu
	130					135				140					
Leu	Cys	Pro	Ala	Gly	His	Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys
145				150					155					160	
Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Ser	Leu
			165					170					175		
Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	Phe	Ser	Asp	Asn	Ser	Ser	Pro	Pro
			180				185					190			
Ala	Val	Pro	Gln	Ser	Tyr	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	Gly
		195					200				205				
Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr
	210					215				220					
Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Met	Gly	Phe	Gly
225				230					235				240		
Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly
			245				250					255			
Val	Arg	Thr	Ile	Thr	Thr	Gly	Ser	Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly
			260				265					270			
Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile
		275					280				285				
Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Leu	Gly	Ile
	290					295				300					
Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	Thr	Val
305				310					315				320		
Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn
			325				330					335			
Ile	Glu	Glu	Val	Ala	Leu	Ser	Thr	Thr	Gly						

Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Glu
 435 440 445
 Thr Ile Thr Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly
 450 455 460
 Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly
 465 470 475 480
 Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys Tyr
 485 490 495
 Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr Val
 500 505 510
 Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp
 515 520 525
 His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp
 530 535 540
 Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Leu Pro Tyr
 545 550 555 560
 Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro
 565 570 575
 Pro Ser Trp Asp Gln Met Trp Lys Cys Leu Ile Arg Leu Lys Pro Thr
 580 585 590
 Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn
 595 600 605
 Glu Val Thr Leu Thr His Pro Val Thr Lys Tyr Ile Met Thr Cys Met
 610 615 620
 Ser Ala Asp Leu Glu Val Val Thr Gly Thr Trp Val Leu Val Gly Gly
 625 630 635 640
 Val Leu Ala Ala Leu Ala Ala Tyr Cys Leu Ser Thr Gly Cys Val Val
 645 650 655
 Ile Val Gly Arg Ile Val Leu Ser Gly Lys Pro Ala Ile Ile Pro Asp
 660 665 670
 Arg Glu Val Leu Tyr Arg Glu Phe Asp Glu Met Glu Glu Cys
 675 680 685

<210> 32

<211> 686

<212> PRT

<213> Artificial Sequence

<220>

<223> Mutant Hepatitis C virus NS3/4A

<400> 32

Met Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly
 1 5 10 15
 Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly
 20 25 30
 Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys
 35 40 45
 Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr
 50 55 60
 Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val Asp
 65 70 75 80
 Gln Asp Leu Val Gly Trp Pro Ala Pro Gln Gly Ala Arg Ser Leu Thr
 85 90 95

Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala		
			100					105					110				
Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	Gly	Asp	Gly	Arg	Gly	Ser	Leu	Leu		
		115					120					125					
Ser	Pro	Arg	Pro	Ile	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu		
		130				135					140						
Leu	Cys	Pro	Ala	Gly	His	Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys		
145					150					155					160		
Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Ser	Leu		
				165					170					175			
Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	Phe	Ser	Asp	Asn	Ser	Ser	Pro	Pro		
			180					185					190				
Ala	Val	Pro	Gln	Ser	Tyr	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	Gly		
		195					200					205					
Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr		
		210				215					220						
Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Met	Gly	Phe	Gly		
225					230					235					240		
Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly		
				245					250					255			
Val	Arg	Thr	Ile	Thr	Thr	Gly	Ser	Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly		
			260					265					270				
Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile		
		275					280					285					
Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Leu	Gly	Ile		
		290				295					300						
Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	Thr	Val		
305					310					315					320		
Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn		
				325					330					335			
Ile	Glu	Glu	Val	Ala	Leu	Ser	Thr	Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly		
			340					345					350				
Lys	Ala	Ile	Pro	Leu	Glu	Ala	Ile	Lys	Gly	Gly	Arg	His	Leu	Ile	Phe		
		355					360					365					
Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	Glu	Leu	Ala	Ala	Lys	Leu	Val	Ala		
		370				375						380					
Leu	Gly	Val	Asn	Ala	Val	Ala	Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val		
385					390					395					400		
Ile	Pro	Thr	Ser	Gly	Asp	Val	Val	Val	Val	Ala	Thr	Asp	Ala	Leu	Met		
				405					410					415			
Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys		
			420					425					430				
Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu		
		435					440					445					
Thr	Ile	Thr	Leu	Pro	Gln	Asp	Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	Gly		
					455						460						
Arg	Thr	Gly	Arg	Gly	Lys	Pro	Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	Gly		
465					470					475					480		
Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr		
				485					490					495			
Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val		
			500					505				510					
Arg	Leu	Arg	Ala	Tyr	Met	Asn	Thr	Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp		
		515					520					525					
His	Leu	Glu	Phe	Trp	Glu	Gly	Val	Phe	Thr	Gly	Leu	Thr	His	Ile	Asp		

<220>

<223> Mutant Hepatitis C virus NS3/4A peptide

<400> 35

Thr	Lys	Tyr	Met	Thr	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Arg	Pro
1				5					10					15	
Ala	Trp	Val	Leu	Val	Gly	Gly	Val	Leu							
			20					25							

<210> 36

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> Mutant Hepatitis C virus NS3/4A peptide

<400> 36

Thr	Lys	Tyr	Met	Thr	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Cys	Ser
1				5					10					15	
Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu							
			20					25							

<210> 37

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> Mutant Hepatitis C virus NS3/4A peptide

<400> 37

Thr	Lys	Tyr	Met	Thr	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Cys	Cys	Ser
1				5					10					15	
Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu							
			20					25							

<210> 38

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> Mutant Hepatitis C virus NS3/4A peptide

<400> 38

Thr	Lys	Tyr	Met	Thr	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Ser	Ser	Ser
1				5					10					15	
Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu							
			20					25							

<210> 39
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant Hepatitis C virus NS3/4A peptide

<400> 39
Thr Lys Tyr Met Thr Cys Met Ser Ala Asp Ser Ser Ser Ser Cys Ser
1 5 10 15
Thr Trp Val Leu Val Gly Gly Val Leu
20 25

<210> 40
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant Hepatitis C virus NS3/4A peptide

<400> 40
Thr Lys Tyr Met Thr Cys Met Ser Ala Asp Val Val Val Val Thr Ser
1 5 10 15
Thr Trp Val Leu Val Gly Gly Val Leu
20 25

<210> 41
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Hepatitis C virus NS5 peptide

<400> 41
Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp Thr Gly
1 5 10 15

<210> 42
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant Hepatitis C virus NS5A/B peptide

<400> 42
Ser Ser Glu Asp Val Val Cys Cys Ser Met Trp Val Leu Val Gly Gly
1 5 10 15

Val Leu

<210> 43

<211> 686

<212> PRT

<213> Artificial Sequence

<220>

<223> Mutant Hepatitis C virus NS3/4A

<400> 43

Met	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly
1				5					10					15	
Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly
			20					25					30		
Glu	Val	Gln	Ile	Val	Ser	Thr	Ala	Ala	Gln	Thr	Phe	Leu	Ala	Thr	Cys
		35					40					45			
Ile	Asn	Gly	Val	Cys	Trp	Thr	Val	Tyr	His	Gly	Ala	Gly	Thr	Arg	Thr
	50					55				60					
Ile	Ala	Ser	Pro	Lys	Gly	Pro	Val	Ile	Gln	Met	Tyr	Thr	Asn	Val	Asp
65					70					75					80
Gln	Asp	Leu	Val	Gly	Trp	Pro	Ala	Pro	Gln	Gly	Ala	Arg	Ser	Leu	Thr
				85					90					95	
Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala
			100					105					110		
Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	Gly	Asp	Gly	Arg	Gly	Ser	Leu	Leu
	115						120					125			
Ser	Pro	Arg	Pro	Ile	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu
	130					135						140			
Leu	Cys	Pro	Ala	Gly	His	Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys
145					150					155					160
Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Ser	Leu
				165					170					175	
Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	Phe	Ser	Asp	Asn	Ser	Ser	Pro	Pro
			180					185					190		
Ala	Val	Pro	Gln	Ser	Tyr	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	Gly
	195					200						205			
Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr
	210					215						220			
Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Met	Gly	Phe	Gly
225					230					235					240
Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly
				245					250					255	
Val	Arg	Thr	Ile	Thr	Thr	Gly	Ser	Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly
			260					265					270		
Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile
	275						280					285			
Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Leu	Gly	Ile
	290					295					300				
Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	Thr	Val
305					310					315					320
Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn
				325					330					335	

Met	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	1	5	10	15
Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly	20	25	30	
Glu	Val	Gln	Ile	Val	Ser	Thr	Ala	Ala	Gln	Thr	Phe	Leu	Ala	Thr	Cys	35	40	45	
Ile	Asn	Gly	Val	Cys	Trp	Thr	Val	Tyr	His	Gly	Ala	Gly	Thr	Arg	Thr	50	55	60	
Ile	Ala	Ser	Pro	Lys	Gly	Pro	Val	Ile	Gln	Met	Tyr	Thr	Asn	Val	Asp	65	70	75	
Gln	Asp	Leu	Val	Gly	Trp	Pro	Ala	Pro	Gln	Gly	Ala	Arg	Ser	Leu	Thr	85	90	95	
Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala	100	105	110	
Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	Gly	Asp	Gly	Arg	Gly	Ser	Leu	Leu	115	120	125	
Ser	Pro	Arg	Pro	Ile	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	130	135	140	
Leu	Cys	Pro	Ala	Gly	His	Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys	145	150	155	
Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Ser	Leu	165	170	175	
Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	Phe	Ser	Asp	Asn	Ser	Ser	Pro	Pro	180	185	190	
Ala	Val	Pro	Gln	Ser	Tyr	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	Gly	195	200	205	
Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	210	215	220	
Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Met	Gly	Phe	Gly	225	230	235	
Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly	245	250	255	
Val	Arg	Thr	Ile	Thr	Thr	Gly	Ser	Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly	260	265	270	
Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile	275	280	285	
Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Leu	Gly	Ile	290	295	300	
Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	Thr	Val	305	310	315	
Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn	325	330	335	
Ile	Glu	Glu	Val	Ala	Leu	Ser	Thr	Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly	340	345	350	
Lys	Ala	Ile	Pro	Leu	Glu	Ala	Ile	Lys	Gly	Gly	Arg	His	Leu	Ile	Phe	355	360	365	
Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	Glu	Leu	Ala	Ala	Lys	Leu	Val	Ala	370	375	380	
Leu	Gly	Val	Asn	Ala	Val	Ala	Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	385	390	395	
Ile	Pro	Thr	Ser	Gly	Asp	Val	Val	Val	Val	Ala	Thr	Asp	Ala	Leu	Met	405	410	415	
Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	420	425	430	
Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu				

435	440	445
Thr Ile Thr Leu Pro Gln Asp	Ala Val Ser Arg Thr Gln Arg Arg Gly	
450	455	460
Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly		
465	470	475
Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys Tyr		480
485	490	495
Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr Val		
500	505	510
Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp		
515	520	525
His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile Asp		
530	535	540
Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Leu Pro Tyr		
545	550	555
Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro		
565	570	575
Pro Ser Trp Asp Gln Met Trp Lys Cys Leu Ile Arg Leu Lys Pro Thr		
580	585	590
Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala Val Gln Asn		
595	600	605
Glu Val Thr Leu Thr His Pro Val Thr Lys Tyr Ile Met Thr Cys Met		
610	615	620
Ser Ala Asp Leu Glu Val Val Arg Pro Thr Trp Val Leu Val Gly Gly		
625	630	635
Val Leu Ala Ala Leu Ala Ala Tyr Cys Leu Ser Thr Gly Cys Val Val		
645	650	655
Ile Val Gly Arg Ile Val Leu Ser Gly Lys Pro Ala Ile Ile Pro Asp		
660	665	670
Arg Glu Val Leu Tyr Arg Glu Phe Asp Glu Met Glu Glu Cys		
675	680	685

<210> 45

<211> 686

<212> PRT

<213> Artificial Sequence

<220>

<223> Mutant Hepatitis C virus NS3/4A

<400> 45

Met Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly	
1	5 10 15
Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly	
20	25 30
Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys	
35	40 45
Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr	
50	55 60
Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val Asp	
65	70 75 80
Gln Asp Leu Val Gly Trp Pro Ala Pro Gln Gly Ala Arg Ser Leu Thr	
85	90 95
Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala	

Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	Gln	Ser	Gly	Glu	Asn	Leu	Pro	Tyr
545					550					555					560
Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro
				565						570					575
Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr
			580					585					590		
Leu	His	Gly	Pro	Thr	Pro	Leu	Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn
		595					600					605			
Glu	Val	Thr	Leu	Thr	His	Pro	Val	Thr	Lys	Tyr	Ile	Met	Thr	Cys	Met
		610				615					620				
Ser	Ala	Asp	Leu	Glu	Val	Val	Arg	Pro	Ala	Trp	Val	Leu	Val	Gly	Gly
625					630					635					640
Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	Cys	Leu	Ser	Thr	Gly	Cys	Val	Val
				645					650					655	
Ile	Val	Gly	Arg	Ile	Val	Leu	Ser	Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp
		660						665					670		
Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	Asp	Glu	Met	Glu	Glu	Cys		
		675					680					685			

<210> 46

<211> 686

<212> PRT

<213> Artificial Sequence

<220>

<223> Mutant Hepatitis C virus NS3/4A

<400> 46

Met	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly
1				5				10					15		
Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly
			20					25					30		
Glu	Val	Gln	Ile	Val	Ser	Thr	Ala	Ala	Gln	Thr	Phe	Leu	Ala	Thr	Cys
		35					40					45			
Ile	Asn	Gly	Val	Cys	Trp	Thr	Val	Tyr	His	Gly	Ala	Gly	Thr	Arg	Thr
	50					55				60					
Ile	Ala	Ser	Pro	Lys	Gly	Pro	Val	Ile	Gln	Met	Tyr	Thr	Asn	Val	Asp
65					70					75					80
Gln	Asp	Leu	Val	Gly	Trp	Pro	Ala	Pro	Gln	Gly	Ala	Arg	Ser	Leu	Thr
				85					90					95	
Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala
			100					105					110		
Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	Gly	Asp	Gly	Arg	Gly	Ser	Leu	Leu
		115					120					125			
Ser	Pro	Arg	Pro	Ile	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu
		130				135						140			
Leu	Cys	Pro	Ala	Gly	His	Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys
145					150					155					160
Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Ser	Leu
				165					170					175	
Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	Phe	Ser	Asp	Asn	Ser	Ser	Pro	Pro
			180					185					190		
Ala	Val	Pro	Gln	Ser	Tyr	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	Gly
		195					200					205			

Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	210	215	220
Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Met	Gly	Phe	Gly	225	230	235
Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly	245	250	255
Val	Arg	Thr	Ile	Thr	Thr	Gly	Ser	Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly	260	265	270
Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile	275	280	285
Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Leu	Gly	Ile	290	295	300
Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	Thr	Val	305	310	315
Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn	325	330	335
Ile	Glu	Glu	Val	Ala	Leu	Ser	Thr	Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly	340	345	350
Lys	Ala	Ile	Pro	Leu	Glu	Ala	Ile	Lys	Gly	Gly	Arg	His	Leu	Ile	Phe	355	360	365
Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	Glu	Leu	Ala	Ala	Lys	Leu	Val	Ala	370	375	380
Leu	Gly	Val	Asn	Ala	Val	Ala	Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	385	390	395
Ile	Pro	Thr	Ser	Gly	Asp	Val	Val	Val	Val	Ala	Thr	Asp	Ala	Leu	Met	405	410	415
Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	420	425	430
Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	435	440	445
Thr	Ile	Thr	Leu	Pro	Gln	Asp	Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	Gly	450	455	460
Arg	Thr	Gly	Arg	Gly	Lys	Pro	Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	Gly	465	470	475
Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	485	490	495
Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val	500	505	510
Arg	Leu	Arg	Ala	Tyr	Met	Asn	Thr	Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	515	520	525
His	Leu	Glu	Phe	Trp	Glu	Gly	Val	Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	530	535	540
Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	Gln	Ser	Gly	Glu	Asn	Leu	Pro	Tyr	545	550	555
Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	565	570	575
Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	580	585	590
Leu	His	Gly	Pro	Thr	Pro	Leu	Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	595	600	605
Glu	Val	Thr	Leu	Thr	His	Pro	Val	Thr	Lys	Tyr	Ile	Met	Thr	Cys	Met	610	615	620
Ser	Ala	Asp	Leu	Glu	Val	Val	Cys	Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	625	630	635
Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	Cys	Leu	Ser	Thr	Gly	Cys	Val	Val	640		

				645					650					655					
Ile	Val	Gly	Arg	Ile	Val	Leu	Ser	Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp				
			660						665					670					
Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	Asp	Glu	Met	Glu	Glu	Cys						
		675						680					685						

<210> 47
 <211> 686
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Mutant Hepatitis C virus NS3/4A

<400> 47

Met	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly				
1				5				10					15						
Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly				
			20					25					30						
Glu	Val	Gln	Ile	Val	Ser	Thr	Ala	Ala	Gln	Thr	Phe	Leu	Ala	Thr	Cys				
		35					40					45							
Ile	Asn	Gly	Val	Cys	Trp	Thr	Val	Tyr	His	Gly	Ala	Gly	Thr	Arg	Thr				
	50					55				60									
Ile	Ala	Ser	Pro	Lys	Gly	Pro	Val	Ile	Gln	Met	Tyr	Thr	Asn	Val	Asp				
65					70				75						80				
Gln	Asp	Leu	Val	Gly	Trp	Pro	Ala	Pro	Gln	Gly	Ala	Arg	Ser	Leu	Thr				
				85				90						95					
Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala				
			100					105					110						
Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	Gly	Asp	Gly	Arg	Gly	Ser	Leu	Leu				
		115					120					125							
Ser	Pro	Arg	Pro	Ile	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu				
	130						135					140							
Leu	Cys	Pro	Ala	Gly	His	Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys				
145					150					155					160				
Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Ser	Leu				
				165				170						175					
Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	Phe	Ser	Asp	Asn	Ser	Ser	Pro	Pro				
			180					185					190						
Ala	Val	Pro	Gln	Ser	Tyr	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	Gly				
		195					200					205							
Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr				
	210					215					220								
Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Met	Gly	Phe	Gly				
225					230					235					240				
Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly				
				245				250						255					
Val	Arg	Thr	Ile	Thr	Thr	Gly	Ser	Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly				
			260					265					270						
Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile				
		275					280					285							
Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Leu	Gly	Ile				
	290					295					300								
Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	Thr	Val				

305					310					315					320
Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn
				325						330				335	
Ile	Glu	Glu	Val	Ala	Leu	Ser	Thr	Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly
			340						345				350		
Lys	Ala	Ile	Pro	Leu	Glu	Ala	Ile	Lys	Gly	Gly	Arg	His	Leu	Ile	Phe
		355					360					365			
Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	Glu	Leu	Ala	Ala	Lys	Leu	Val	Ala
	370					375					380				
Leu	Gly	Val	Asn	Ala	Val	Ala	Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val
385				390						395				400	
Ile	Pro	Thr	Ser	Gly	Asp	Val	Val	Val	Val	Ala	Thr	Asp	Ala	Leu	Met
			405						410					415	
Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys
		420					425					430			
Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu
	435						440				445				
Thr	Ile	Thr	Leu	Pro	Gln	Asp	Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	Gly
	450				455					460					
Arg	Thr	Gly	Arg	Gly	Lys	Pro	Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	Gly
465				470					475					480	
Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr
			485				490					495			
Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val
	500						505				510				
Arg	Leu	Arg	Ala	Tyr	Met	Asn	Thr	Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp
	515				520						525				
His	Leu	Glu	Phe	Trp	Glu	Gly	Val	Phe	Thr	Gly	Leu	Thr	His	Ile	Asp
	530				535					540					
Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	Gln	Ser	Gly	Glu	Asn	Leu	Pro	Tyr
545				550					555					560	
Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro
			565				570					575			
Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr
	580						585					590			
Leu	His	Gly	Pro	Thr	Pro	Leu	Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn
	595					600					605				
Glu	Val	Thr	Leu	Thr	His	Pro	Val	Thr	Lys	Tyr	Ile	Met	Thr	Cys	Met
	610				615					620					
Ser	Ala	Asp	Leu	Glu	Val	Cys	Cys	Ser	Thr	Trp	Val	Leu	Val	Gly	Gly
625				630					635					640	
Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	Cys	Leu	Ser	Thr	Gly	Cys	Val	Val
			645				650					655			
Ile	Val	Gly	Arg	Ile	Val	Leu	Ser	Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp
		660					665				670				
Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	Asp	Glu	Met	Glu	Glu	Cys		
	675					680					685				

<210> 48

<211> 686

<212> PRT

<213> Artificial Sequence

<220>

<400> 48

- 53 -

Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys
			420					425					430		
Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu
		435					440					445			
Thr	Ile	Thr	Leu	Pro	Gln	Asp	Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	Gly
	450					455					460				
Arg	Thr	Gly	Arg	Gly	Lys	Pro	Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	Gly
465					470					475					480
Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr
				485					490					495	
Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val
		500						505					510		
Arg	Leu	Arg	Ala	Tyr	Met	Asn	Thr	Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp
	515						520					525			
His	Leu	Glu	Phe	Trp	Glu	Gly	Val	Phe	Thr	Gly	Leu	Thr	His	Ile	Asp
	530					535					540				
Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	Gln	Ser	Gly	Glu	Asn	Leu	Pro	Tyr
545					550					555					560
Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro
				565					570					575	
Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys	Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr
			580					585					590		
Leu	His	Gly	Pro	Thr	Pro	Leu	Leu	Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn
	595						600					605			
Glu	Val	Thr	Leu	Thr	His	Pro	Val	Thr	Lys	Tyr	Ile	Met	Thr	Cys	Met
	610					615					620				
Ser	Ala	Asp	Leu	Glu	Val	Ser	Ser	Ser	Thr	Trp	Val	Leu	Val	Gly	Gly
625					630					635					640
Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	Cys	Leu	Ser	Thr	Gly	Cys	Val	Val
			645						650					655	
Ile	Val	Gly	Arg	Ile	Val	Leu	Ser	Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp
		660						665				670			
Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	Asp	Glu	Met	Glu	Glu	Cys		
		675					680					685			

<210> 49

<211> 686

<212> PRT

<213> Artificial Sequence

<220>

<223> Mutant Hepatitis C virus NS3/4A

<400> 49

Met	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly
1				5					10					15	
Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly
			20					25					30		
Glu	Val	Gln	Ile	Val	Ser	Thr	Ala	Ala	Gln	Thr	Phe	Leu	Ala	Thr	Cys
		35					40				45				
Ile	Asn	Gly	Val	Cys	Trp	Thr	Val	Tyr	His	Gly	Ala	Gly	Thr	Arg	Thr
	50					55				60					
Ile	Ala	Ser	Pro	Lys	Gly	Pro	Val	Ile	Gln	Met	Tyr	Thr	Asn	Val	Asp
65					70					75					80

Gln	Asp	Leu	Val	Gly	Trp	Pro	Ala	Pro	Gln	Gly	Ala	Arg	Ser	Leu	Thr		
				85					90					95			
Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	Leu	Tyr	Leu	Val	Thr	Arg	His	Ala		
			100					105					110				
Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	Gly	Asp	Gly	Arg	Gly	Ser	Leu	Leu		
		115					120					125					
Ser	Pro	Arg	Pro	Ile	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu		
		130				135					140						
Leu	Cys	Pro	Ala	Gly	His	Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys		
145					150					155				160			
Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Ser	Leu		
				165					170					175			
Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	Phe	Ser	Asp	Asn	Ser	Ser	Pro	Pro		
			180					185					190				
Ala	Val	Pro	Gln	Ser	Tyr	Gln	Val	Ala	His	Leu	His	Ala	Pro	Thr	Gly		
		195				200						205					
Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr		
	210				215					220							
Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	Val	Ala	Ala	Thr	Met	Gly	Phe	Gly		
225					230					235				240			
Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly		
				245					250					255			
Val	Arg	Thr	Ile	Thr	Thr	Gly	Ser	Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly		
			260					265					270				
Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile		
		275				280						285					
Ile	Cys	Asp	Glu	Cys	His	Ser	Thr	Asp	Ala	Thr	Ser	Ile	Leu	Gly	Ile		
	290				295						300						
Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	Thr	Ala	Gly	Ala	Arg	Leu	Thr	Val		
305					310					315				320			
Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	Ser	Val	Thr	Val	Pro	His	Pro	Asn		
				325					330					335			
Ile	Glu	Glu	Val	Ala	Leu	Ser	Thr	Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly		
			340					345					350				
Lys	Ala	Ile	Pro	Leu	Glu	Ala	Ile	Lys	Gly	Gly	Arg	His	Leu	Ile	Phe		
		355					360					365					
Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	Glu	Leu	Ala	Ala	Lys	Leu	Val	Ala		
		370				375						380					
Leu	Gly	Val	Asn	Ala	Val	Ala	Tyr	Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val		
385					390					395				400			
Ile	Pro	Thr	Ser	Gly	Asp	Val	Val	Val	Val	Ala	Thr	Asp	Ala	Leu	Met		
				405					410					415			
Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp	Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys		
			420					425					430				
Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu		
		435					440					445					
Thr	Ile	Thr	Leu	Pro	Gln	Asp	Ala	Val	Ser	Arg	Thr	Gln	Arg	Arg	Gly		
					455						460						
Arg	Thr	Gly	Arg	Gly	Lys	Pro	Gly	Ile	Tyr	Arg	Phe	Val	Ala	Pro	Gly		
465					470					475				480			
Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr		
				485					490					495			
Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	Leu	Thr	Pro	Ala	Glu	Thr	Thr	Val		
			500					505					510				
Arg	Leu	Arg	Ala	Tyr	Met	Asn	Thr	Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp		

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